UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,876	01/23/2002	Michael Johnson	256.116US1	8875

128 7590 09/20/2005

HONEYWELL INTERNATIONAL INC.
101 COLUMBIA ROAD
P O BOX 2245
MORRISTOWN, NJ 07962-2245

EXAMINER	
BOWEN, MICHAEL WAYNE	
ART UNIT	**PAPER NUMBER**
2625	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/055,876	JOHNSON ET AL.	
	Examiner	Art Unit	
	Michael W. Bowen	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 April 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/22/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because item 405 in figure 4 does not correspond with the description in the specification (attribute rules, p. 15, line 18). Instead, this item appears to be a duplication of item 403. Also, the specification refers to the template as item 405 instead of item 400 (p. 15, line 19). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7, 10, 19, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by the article "Application Constraints in the Design of an Automatic Reading Device for Analog Display Instruments," by Robert Sablatnig et al., hereinafter called Sablatnig.

3. Regarding claim 7, Sablatnig discloses the following:

A method of converting an instrument reading to digital information storage on a computer readable medium, comprising:

Receiving an electronic image of an instrument having one or more image features necessary for resolving an instrument reading (i.e. image acquisition, p. 208, col. 2, paragraph 1; fig. 2 and 3, which show an instrument with circular and square scales);

Isolating each image feature (i.e. primitive, p. 205, col. 2, section 2, paragraph 1) within the image by comparing each isolated image to its own feature vector (i.e. The primitiva's relative parameters...have to be known a priori to detect them, p.

206, col. 1, section 3, paragraph 1. Note that the parameters are predefined characteristics which constitute a feature vector.);

Mapping or calculating each isolated image feature to its own value, the value associated with each isolated image feature's orientation within the image (i.e. This [scale and pointer detection] analysis step supplies the specific position and size for all scales and pointers as well as the orientation of the instrument, p. 208, col. 2, section 3.5, paragraph 4);

And

Determining the instrument reading by performing a calculation on the values (i.e. The value for each measuring unit is determined by relating the position of the pointer to the orientation of the scale, p. 208, col. 2, section 3.5, paragraph 6).

4. Regarding claim 10, Sablatnig reveals the following:

The method of claim 7, wherein the instrument is a control panel (i.e. analog control instrument, p. 205, col. 1, section 1, paragraph 1).

5. Regarding claim 19, Sablatnig discloses a computer system (i.e. Unix platform, p. 210, col. 2, section 5, paragraph 1; standard PC 486 configuration, p. 211, col. 1, section 5.2, paragraph 1) which characteristically contains a storage medium for storing data and instructions. Thus it is understood that the parameters, algorithms and

methods described by Sablatnig are stored as functional data. Therefore, Sablatnig discloses the following:

A computer readable medium having functional data stored thereon used to translate image data, the function data comprising:

Image data including one or more instrument images (p. 207, fig. 2,3).

Rules data uniquely associated with one or more of the instrument images (e.g. steps for rectangular scale detection, p. 207, col. 1, section 3.2, paragraph 1).

Processing instruction data (i.e. algorithm, p. 207, col. 1, section 3.2, paragraph 1; detection method, p. 206, col. 2, section 3.1, paragraph 1) operable to isolate each instrument image and use the rules data to detect one or more reading indicators (i.e. circular scale detection, p. 206, col. 2, section 3.1; rectangular scale detection, p. 207, col. 1, section 3.2; pointer detection, p. 207, col. 1, section 3.3) within each instrument image and translate one or more of the reading indicators into an instrument reading represented by the image data (i.e. measuring unit and value determination, p. 208, col. 2, paragraph 6).

6. Regarding claim 21, Sablatnig reveals the following:

The functional data of claim 19, further comprising attribute data (i.e. attributes length, location, orientation, p. 207, col. 1, section 3.2, paragraph 1, step 3) used by the rules data, wherein the attribute data include one or more attributes associated with each instrument image.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sablatnig as applied to claim 10 above, and further in view of U.S. Patent 6,092,008 (Bateman et al., hereinafter called Bateman). Sablatnig reveals the method of claim 10, on which claim 11 depends. However, he does not teach the use of a remote monitoring system in a vehicle. In contrast, Bateman discloses such a system for an aircraft, with cameras in the cockpit (col. 7, lines 32-39; col. 8, lines 37-40, 57-60; fig. 1, item CI). It is noted that at the time of the invention it was known that analog instruments were used in older aircraft. Sablatnig and Bateman are analogous art because they both involve the use of cameras to record information which could not be recorded otherwise. Thus it would have been obvious to one skilled in the art at the time of the invention to combine the instrument monitoring system of Sablatnig with the flight monitoring system of Bateman because such a system in an aircraft with analog instruments would result in greater safety (p. 205, col. 1, section 1, paragraph 1).

9. Claims 12, 22-25, and 29 rejected under 35 U.S.C. 103(a) as being unpatentable over Sablatnig and further in view of U.S. Patent 4,408,342 (Grabowski et al., hereinafter called Grabowski).

10. Regarding claim 12, Sablatnig reveals the following:

A method of processing an image, comprising:

Identifying one or more sub-images which are associated with an image of one or more instrument panels of one or more devices (i.e. scale and pointer detection, p. 208, col. 2, paragraph 4);

And

Using the values to generate one or more readings for one or more of the instrument panels of one or more of the devices (i.e. measuring unit and value determination, p. 208, col. 2, section 3.5, paragraph 6).

Sablatnig does not disclose the following:

Identifying values represented by one or more located features within each sub-image by using one or more templates.

Grabowski discloses the use of template matching to locate character features within a sub-image. These characters represent numbers or values. See col. 6, lines 11-13, and the templates shown in fig. 8. Sablatnig and Grabowski are analogous art because they both involve identifying features in an image. Hence, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify the image processing method of Sablatnig with the template matching method of Grabowski because this

would provide a reliable optical character recognition method for identifying character values (col. 1, lines 9-10) on an instrument scale.

11. Regarding claim 22, Sablatnig reveals the following:

A system for capturing (i.e. image acquisition, p. 209, col. 1, section 4.1, paragraphs 1,2) and processing (i.e. PC 486 configuration, p. 211, col. 1, section 5.2, paragraph 1) images, comprising:

A camera to capture an image (i.e. CCD camera, p. 209, col. 1, section 4.1, paragraph 2);

A feature vector (i.e. primitiva parameters, p. 206, col. 1, section 3, paragraph 1) defining a feature within the sub-image; and

A processing set of executable instructions (i.e. algorithms, p. 206, section 3, paragraph 1) operable to extract a location of the feature within the sub-image (i.e. scale and pointer detection, p. 208, col. 2, section 3.5, paragraph 4) by using the template (discussed below) and the feature vector.

Sablatnig reveals the use of bitmaps as templates, but he does not reveal the following:

A template uniquely associated with a sub-image of the image.

However, Grabowski reveals a set of templates (fig. 8), some of which are used as character delimiters and are uniquely associated with a sub-image (i.e. data block, col. 3, line 27) of the image. Sablatnig and Grabowski are analogous art because they both describe a system for capturing and processing images that include characters. Thus it would have been obvious to one with ordinary skill in the art to modify the system of

Sablatnig by incorporating the method of Grabowski because this would have produced a reliable optical character recognition method (col. 1, lines 9-10).

12. Regarding claim 23, Sablatnig reveals the following:

The system of claim 22 further comprising, a mapping set of executable instructions operable to map the location to a value (i.e. The value for each measuring unit is determined by relating the position of the pointer to the orientation of the scale, p. 208, col. 2, section 3.5, paragraph 6).

Sablatnig's process of relating a position to a value is understood to be a mapping which is implemented as a set of executable instructions (i.e. algorithm, p. 207, col. 2, section 3.3, paragraph 4, line 5).

13. Regarding claim 24, Sablatnig discloses the following:

The system of claim 23 wherein the value is associated with a reading on an instrument panel (i.e. the measurement value of the instrument, p. 208, col. 2, paragraph 6, lines 6-7; p. 208, fig. 5).

14. Regarding claim 25, Sablatnig discloses the following:

The system of claim 23 further comprising, a recording set of executable instructions operable to record the value (i.e. all measurements have to be archived, p. 210, col. 2, section 5, paragraph 5).

It is understood that the archiving procedure described by Sablatnig is performed by a set of executable instructions because it is implemented on a computer system.

15. Regarding claim 29, Sablatnig does not perform camera calibration (p. 209, col. 1, section 4.1, paragraph 4, line 10). However, he does disclose the following:

> The system of claim 22, further comprising a calibration set of executable instructions operable to calibrate the captured image.

Specifically, Sablatnig measures the center of the instrument in the image (p. 208, col. 2, section 3.5, paragraph 3, lines 8-9), which is where the origin of the coordinate system is placed. Also, the orientation of the instrument is measured (p. 208, col. 2, section 3.5, paragraph 4, line 20) so that the scales can be extracted from the image. These operations are understood to be forms of calibration.

16. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sablatnig and Grabowski, and further in view of U.S. Patent 5,438,329 (Gastouniotis et al., hereinafter called Gastouniotis). Sablatnig mentions image sampling rate (p. 206, col. 1, section 2, paragraph 5, line 4) and archiving of multiple measurements (p. 210, col. 2, section 5, paragraph 5), but he does not disclose the following:

> The system of claim 22 further comprising, a camera controlling set of executable instructions operable to capture one or more additional images at configurable periods.

However, Gastouniotis reveals a remote monitoring system which transmits instrument readings, and this system includes instructions for transmitting data at configurable intervals (col. 14, lines 24-26). Sablatnig and Gastouniotis are analogous art because they both describe a system of remotely monitoring measuring instruments. Hence, it would have been obvious to one skilled in the art at the time of the invention to modify the system of Sablatnig by including the configuration method of Gastouniotis, because this would enable efficient use of limited resources such as transmitter power, communication bandwidth, and data storage space, while allowing all significant events to be monitored as circumstances warrant.

17. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sablatnig and Gastouniotis. Sablatnig reveals the features of claim 19, on which claim 20 depends. However, he does not explicitly reveal the contents of claim 20. Gastouniotis does teach the features of this claim, namely:

> The functional data of claim 19, further comprising transmitting instruction data (i.e. interrogation message, col. 10, line 51; reply message, col. 11, line 29) operable to transmit one or more of the reading indicators (i.e. instrument link ID, col. 11, lines 30-31) and the instrument reading (i.e. data to be transmitted, col. 11, line 30; remote instrument reading, col. 2, line 8).

Sablatnig and Gastouniotis are analogous art because they both deal with the monitoring of instrument measurements. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the instrument reading system of

Sablatnig by adding the transmission feature of Gastouniotis because this would allow monitoring of multiple instruments that are remotely located and inaccessible (col. 1, lines 16-19).

18. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sablatnig and Grabowski as applied to claim 22 above, and further in view of Bateman. Regarding claim 27, Sablatnig does not reveal the following:

> The system of claim 22 further comprising, one or more additional cameras capturing one or more additional images.

However, Bateman reveals a remote monitoring system for an aircraft in which multiple cameras monitor the interior of the aircraft, including the cockpit (col. 5, lines 50-51; col. 7, lines 32-40; col. 8, lines 57-60; fig. 1, item CI; fig. 2, item 30). Operating parameters are recorded. Sablatnig and Bateman are analogous art because they both involve remote monitoring applications. Consequently, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Sablatnig by using multiple cameras as disclosed by Bateman because this would enable the monitoring of multiple measuring instruments.

19. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sablatnig and Grabowski as applied to claim 22 above, and further in view of the article "Automation of Reading Liquid-in-Glass Thermometers," by Batagelj et al. (hereinafter called Batagelj).

Sablatnig mentions the option of performing preprocessing to compensate for illumination problems, but he does not disclose the following:

> The system of claim 22 further comprising, an image enhancing set of executable instructions operable to improve a quality associated with the image before being processed by the processing set of executable instructions.

However, Batagelj discloses the use of digital filtering to improve the reading of a measuring instrument (p. 1595, col. 2, lines 15-16). Sablatnig and Batagelj are analogous art because they both describe an automated system for recording readings from an analog measuring instrument. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Sablatnig by including the image enhancement described by Batagelj because this would provide more reliable readings (p. 1595, col. 2, lines 27-28).

20. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sablatnig as applied to claim 7 above, and further in view of Batagelj.

Sablatnig reveals the method of claim 7, on which claims 8 and 9 depend. He also explains that his method determines the orientation of the instrument (see the response to claim 7). However, he does not explicitly disclose the following:

> The method of claim 7 further comprising calibrating the isolating step one time before capturing the image.

The method of claim 8 further comprising determining a degree of angular orientation associated with calibrating and using the angular orientation in isolating each image feature.

Batagelj discloses an initial calibration step in which an image of a measuring instrument is rotated prior to feature extraction (p. 1595, col. 1, lines 14-16; fig. 2,3). Sablatnig and Batagelj reveal prior art that is analogous because they both involve automated reading of analog measurement instruments. Thus it would have been obvious to one skilled in the art at the time of the invention to modify the method of Sablatnig by including the calibration step of Batagelj because this reduces constraints on the position of the measuring instrument (i.e. This makes placement...much more flexible, p. 1595, col. 1, lines 16-17).

21. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sablatnig, The Image Processing Handbook by Russ (hereinafter called Russ), and U.S. Patent 5,528,698 (Kamei et al., hereinafter called Kamei).

22. Regarding claim 1, Sablatnig reveals the following:

A method of processing an image, comprising:

Receiving one or more sub-images within an image (i.e. image acquisition, p. 208, col. 2, section 4, paragraph 1; detecting the instrument in the image, p. 208, col. 1, section 3.5, paragraph 3; see camera and instrument in fig. 7-9);

Separating each sub-image from the image (i.e. detection and localization of measuring unit primitiva, p. 208, col. 2, paragraph 4; see detected circles and rectangles in fig. 2 and 3 on p. 207);

Processing one or more rules associated with one or more of the located features (i.e. ...algorithms for detecting...shapes were tested and combined in order to be able to detect the primitiva in the image and to read the value the measuring instrument displays, p. 206, col. 1, section 3, paragraph 1).

23. Although Sablatnig reveals the use of templates to identify characters (i.e. bitmaps, p. 208, col. 1, section 3.4, line 7), he does not explicitly associate a template with each sub-image. However, Russ discloses the following:

Associating a template with each sub-image.

Russ describes template matching (p. 365) and he explains that it can be applied to text as well as non-text images. He shows an example in which the template of a character is matched to individual letters in a sentence (p. 366, paragraph 3; p. 367, fig. 83-85). Each letter can be interpreted as a sub-image.

The primitive detection method of Sablatnig and the template matching method of Russ are analogous art because they both involve image processing. Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify the method of Sablatnig by using the method of Russ, because template matching is a basic method of feature recognition and classification.

Sablatnig discloses the use of feature parameters (p. 206, col. 1, section 3, paragraph 1), which are equivalent to feature vectors, but he does not associate them with templates. However, Kamei discloses the following:

> Using one or more feature vectors associated with each template to locate one or more features within the sub-images.

Specifically, Kamei describes the use of feature vectors (i.e. characteristics) in a set of templates. These characteristics are matched to a feature vector space (col. 6, lines 54-59).

The image processing methods of Sablatnig and Kamei are analogous art because they both involve feature detection. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Sablatnig by including the template and feature vector matching method of Kamei because this is an effective and well-known method of classifying features.

24. Regarding claim 2, Sablatnig reveals the following:

> The method of claim 1 further comprising calculating an instrument reading from one or more of the located features using one or more of the associated rules (i.e. detecting the position of scales and pointers in the intensity image to determine the value the measuring instrument displays, p. 205, col. 1, section 1, paragraph 2; algorithms...to read the value the measuring instrument displays, p. 206, col. 1, section 3, paragraph 1; p. 208, fig. 6, measuring unit and value determination step).

25. Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sablatnig, Russ, and Kamei as applied to claims 1 and 2, and further in view of Gastouniotis.

26. Regarding claim 3, Sablatnig does not reveal the following:

The method of claim 2 further comprising electronically transmitting the instrument reading.

However, Gastouniotis discloses a system in which an instrument electronically transmits readings to a remote location (see col. 4, lines 6-14, fig. 1, 2).

The methods of Sablatnig and Gastouniotis are analogous art because they both involve monitoring measuring instruments. Thus, it would have been obvious to one skilled in the art at the time of the invention to modify the method of Sablatnig by adding the transmitting method of Gastouniotis because this would allow the measurements to be monitored, analyzed, and stored remotely.

27. Regarding claim 4, Sablatnig reveals the following:

The method of claim 3 wherein the instrument reading is associated with one of the sub-images, which represents a picture of an instrument panel.

Refer to fig. 4, which shows scales of an instrument panel obtained from a sub-image. The scales contain a pointer from which a measurement is read. Sablatnig states that after scale and pointer detection, "The value for each measuring unit is determined by

relating the position of the pointer to the orientation of the scale" (see p. 208, col. 2, section 3.5, paragraph 6).

28. Regarding claim 5, Sablatnig does not reveal the following:

The method of claim 1 further comprising, periodically repeating all the steps. However, the remote monitoring system of Gastouniotis has an operating mode in which "the instrument link...automatically transmits data to the remote station at a prescribed interval" (col. 14, lines 16-18). As noted for claim 3, the inventions of Sablatnig and Gastouniotis are analogous art. Thus, it would have been obvious to one skilled in the art at the time of the invention to modify the method of Sablatnig by adding the method of Gastouniotis because periodic transmission of measurements provides an improved monitoring ability.

29. Regarding claim 6, Sablatnig does not disclose the following:

The method of claim 5 wherein a period to repeat the steps is customizable. However, the system of Gastouniotis can "process commands that may be sent to change...transmit interval" (col. 14, lines 23-26). The motivation for combining Sablatnig and Gastouniotis is explained in the discussion of claim 5.

30. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grabowski, and further in view of Digital Image Processing by Kenneth Castleman (hereinafter called Castleman). Grabowski reveals the following:

A computer readable medium (i.e. memory, fig. 1, item 20) having an image template (fig. 8) used to process image data (fig. 5A), comprising:

A template type uniquely identifying the template and assigned to a defined region of the image.

Specifically, Grabowski shows numerous types of templates (fig. 8) which are matched to specific locations in the image (i.e. starting locations...stored in a location table, col. 1, lines 61-64; fig. 5A).

Grabowski does not explicitly reveal the following:

One or more feature recognition attributes.

However, Castleman describes the use of attributes for feature extraction (i.e. features, p. 448, lines 12-14).

Grabowski also does not disclose the following:

A feature recognition vector associated with detecting a feature image within the defined region by searching the defined region for one or more of the feature recognition attributes.

Castleman reveals a feature vector (p. 448, line 15) which is derived from a set of features. The feature vector is used for object classification (p. 448, line 27), which can be broadly interpreted as an aspect of detection (i.e. Each object is recognized as being of one particular type, p. 448, lines 21-22, fig. 18-1).

Grabowski and Castleman are analogous art because they both use data structures (templates and feature vectors) to identify an object in an image. Therefore it would have been obvious to one skilled in the art at the time of the invention to combine the

teaching of Grabowski with the teaching of Castleman because attributes and feature vectors are a basic aspect of pattern recognition which can improve the detection of feature images.

31. Regarding claim 14, Grabowski reveals the use of multiple types of templates as described in the discussion of claim 13. However, he does not reveal the following:

> The template of claim 13 further comprising, one or more attribute rules associated with the template type, wherein one or more of the rules and operable to be used by a processing set of executable instructions to extract or associate information from the feature image.

Castleman discloses classification rules (p. 449, line 18) implemented by a computer (p. 449, lines 6-7) which uses features (diameter and redness, p. 449, lines 15-16) to extract or associate information from the feature image (p. 449, fig. 18-2; p. 450, fig. 18-3). The motivation for combining Grabowski and Castleman is similar to that explained in response to claim 13.

32. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grabowski and Castleman as applied to claim 14 above, and further in view of Sablatnig.

33. Regarding claim 15, neither Grabowski nor Castleman reveal the following:

The template of claim 14 wherein the information includes associating an instrument reading with the feature image.

However, Sablatnig discloses an instrument reading (i.e. measuring unit and value determination, p. 208, col. 2) derived from a feature image (i.e. detected circles and rectangle, p. 207, fig. 2, 3). Sablatnig, Grabowski, and Castleman are analogous art because they describe the detection of features in images. Thus, it would have been obvious to combine the teaching of Sablatnig with the teaching of Grabowski and Castleman because it would provide an automated method of monitoring instrument readings for the purpose of increased safety and more efficient calibration of instruments (p. 205, col. 1, section 1, paragraph 1).

34. Regarding claim 16, Grabowski and Castleman do not disclose the following:

The template of claim 15 wherein instrument reading depends on a detected orientation of feature image within the image data.

Although Grabowski discloses the consideration of skew and vertical misalignment of a feature (col. 3, lines 42-46), he does not discuss orientation. However, Sablatnig reveals an instrument reading that depends on the orientation of a feature image (i.e. The value for each measuring unit is determined by relating the position of the pointer to the orientation of the scale, p. 208, col. 2, section 3.5, paragraph 6). The motivation for combining Sablatnig with Grabowski and Castleman is the same is that described in the response to claim 15.

35. Regarding claim 17, Castleman does not reveal the following:

The template of claim 14 wherein the information includes extracted numeric characters, symbol characters, or alpha characters.

Grabowski reveals numeric, symbol, and alpha characters extracted from an image (fig. 5C, character templates in fig. 8). Also, Sablatnig discloses characters extracted from a feature image (i.e. detection of lettering elements, p. 208, col. 1, section 3.4, paragraph 1; lettering in fig. 1, p. 206). The motivation for combining Sablatnig with Castleman and Grabowski is similar to that given in the response to claim 15.

36. Regarding claim 18, Castleman does not reveal the following:

The template of claim 17 wherein the information is extracted using an optical character recognition set of executable instructions.

However, Grabowski reveals a template (fig. 8) used in an optical character recognition system (col. 2, line 41). The template is used to extract information by means of a character recognition algorithm (col. 4, line 23) which is equivalent to an optical character recognition set of executable instructions.

In addition, Sablatnig discloses the detection of letters with the use of bitmaps (p. 208, col. 1, section 3.4, paragraph 1). The motivation for combining Castleman and Grabowski was discussed in the response to claim 13, while the motivation for combining Sablatnig with Castleman and Grabowski was explained in the response to claim 15.

37. Other related prior art is listed below.

U.S. Patent 4,581,762 (Lapidus et al.): A camera-based optical inspection system in a manufacturing environment. The calibration of an analog speedometer is shown as an example. Templates are used.

U.S. Patent 6,845,177 (Chiu): A method and apparatus for remotely monitoring analog meters using a camera. The reading is transmitted over a wireless communication network.

U.S. Patent 6,721,640 (Glenn et al.): An aircraft monitoring system that uses cameras in the cockpit to record flight data.

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael W. Bowen whose telephone number is (571)272-5969. The examiner can normally be reached on M-F 8AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571)272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MWB

BHAVESH M. MEHTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600